TO THE

RIGHT HONOURABLE

ARTHUR

EARL of ANGLESEY

One of the LORDS of His Majeſties moſt Honourable Privy Counſel, &c.

My Lord,

YOUR Lordſhips many favours towards me, and mine own engagements to record the modern Reſuſcitations and Advancements of the Philoſophical Sciences, for which you have alwaies ſhew'd a more than Ordinary propenſion, do, in all reſpects, both oblige and encourage me to dedicate this Volume of Philoſophical Tranſactions *to your Lordſhip.*

My Lord, it hath been reported, that Philoſophy and all kinds of polite Literature have commonly retired to the obſcureſt receſſes, for ſhelter from the noiſe of War, and have expired or been almoſt extinguiſht by publick Calamities. But theſe our Generous Philoſophers, whom I have devoted my ſervices to, held out in all the Combuſtions of our former Wars, when our potent Neighbors aſſaulted us on all ſides, and when the Peſtilence and Fire had waſted our Mother City. And they brought in not a few additions of Materials and Aids, to all that had been eſſay'd in former Ages, or had been invented or proſecuted by the modern enterprizes of thoſe admirable Men, our Gilbert, Galilæus, *our Lord* Bacon, Peyreſke, Torricellius, Gaſſendus, Des-Cartes, Harvey, *and many others worthy of everlaſting monuments. Theſe were bright Stars of the firſt magnitude; yet their greateſt Deſigns were lately illuſtrated, enlarged, methodized, and, ſome way or other, improved to more maturity and perfection; as may be ſeen in the* Hiſtory of the R. Society, *and ſometimes more particularly in the* rude Miſcellanies *of theſe Tranſactions.*

So much have the nobleſt Arts flouriſht amongſt us ever ſince His Majeſties moſt auſpicious Reſtauration (partly by the recovery of Antiquities, partly by recent aides, and ſucceſsful Inventions,) even in theſe roughеſt times of publick conflicts, that it may remain for a ſufficient proof, that this Practical Philoſophy is not an effeminate or effete

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ſtudy, but efficaciouſly ſerviceable, under the heavieſt incumbrances, as well for the defence of our King and Country againſt hoſtile Invaſions and Encroachments, and for ſupply of neceſſaries for life, health, and ſtrength in War. as for Accommodations, Elegancies and Ornaments in times of Peace and Proſperity.

'Tis manifeſt, that the Mathematical *and* Mechanical *Arts are no leſs ſeaſonable in theſe our Colliſions for the ſkill and ſecurity of Navigation; and for Naval Architecture; for Engins, Fortifications, Artillery, and the modern Tacticks:* Medicine *and* Chirurgery *for the recovery of decayed health, and the healing of loſt or wounded limbs;* Agriculture *for ſuſtenance; and, in remembrance of the old Heroes, I may add Martial* Muſic, *to excite Courage: and other Old and New Inventions proper to furniſh other advantages: Then ſofter Delicacies are fit for treatments, ſatisfactions and political endearments in the eſtabliſhment of ſafe and peaceable Government. An* Archimedes *may as juſtly deſerve applauſe for his ſtout defence of* Syracuſa, *as* Phidias *for the tender touches of his Chiſel in faſhioning the Pourtraitures of Jupiter and Minerva.*

And 'tis by the Intelligent acknowledged, That there are, at this day, a great number of more excellent Artificers, in almoſt all kinds of Works, which are deduced from the Ingenuous Arts, for ſtrength and beauty, and for all neceſſaries and all curioſities, than, I think, were ever before ſeen in England; and that theſe Arts cou'd not have grown ſo ſoon to ſuch height, if his Majeſties extraordinary Magnificence and the Public Exigences had not concurr'd to excite almoſt an Univerſal Induſtry. By the divine conduct, immediately after His Majeſties return, his Countenance and his own great Example in Repairing and Adorning his Royal Palaces, and in ſtrengthning and increaſing his Navy; and his Royal Grant of a Charter to eſtabliſh the Royal Society *(according to* Cicero's *ſentence,* Honos alit artes:) *All theſe encouragements made the way, and prepar'd ſkilful Maſters and Guides, to ſurvey, direct and promote all ſplendid Structures and Embelliſhments, which are now ſo conſpicuous in the chief places of this Kingdom; and the abundance of goodly Ships, which do now ride in all our navigable Rivers and in all our Seas.*

But I muſt decline a Task too hard for my pen, and too great for my leiſure; and ſhall humbly preſent before your Lordſhips eye a cloſer and ſhorter view of ſome particulars contain'd in this ſmall Volume. Aſtronomy, *and other chief parts of the Mathematicks; and a diligent ſearch into the depths of nature, into the nature of Animals, Vegetables, and all Simples, Compounds and Mixtures, were the buſineſs, and in*

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ſome manner appertain'd to the devotion of the Mighty Monarchs, Patriarchs and Wiſe men of the Eaſt. Here *we have an account of ſeveral Novelties in the Heavens, and Changes in the Fixed Stars; the Orbits of the Planets, and the Periods of their rotations, in a ſure way to be aſcertain'd to the minuteſt meaſures of Time and Place. A Comet was ſeen, though but by a few, in the Spring of this Year;* Here *his appearances and motions are diligently calculated. The Abſtruſities of Mathematicks in ſeveral points rendred eaſie. Brief and eaſie methods of* Tangents *for many uſes. Algebraical additions, and a Body of* Algebra *under hand.* Muſic *open'd Philoſophically, Mathematically and Practically.* Opticks *gave us the advantage above our Anceſtors for the view of things preſent and at remoteſt diſtance:* Here *we are offer'd friſh accomp iſhments of Opticks and Perſpective; and a Reflecting Teleſcope, which promi eth and is like to perform more than has hitherto been attained by any approaching proportion of Meaſure.* Light *and* Colors *ſhew us all the beauty of this our world: much hath been done lately, with great ſucceſs, to indicate the nature of both, beyond all expectation. And here we have ſecond Adviſes of the nature of both; that Light is not abſolutely pure, but heterogencous; Whiteneſs not ſimple, but an Aggregate of all Colors. Light reſulting from dead-fleſh, both before it be ſenſibly putrified, and when it is putrified.* Here Anatome *ſearches near to the Originals of Animal-propagation, and of human contexture; diſſects alſo the Veins of Vegetables, and there finds ſomething analogous to Blood and Sence. Our* Scarborough-*Spaw is again anatomiſed ſpagyrically: And the* Aponenſian *Baths of Italy, long ago admired by* Livy *and* Claudian, *are here re-examin'd. Common Stones are required to ſhew the Cauſes and Cure of the tormenting* Calculus; *concerning which here is found an inſtance of one bred under the tongue of a man. The Origin and Virtues of* Gems *are careful'y diſcuſs'd.* Chymiſtry *is here freed from the ſmuttineſs of ſmoaking vapors, performing much without fire, meerly by curious waies of Digeſtion, Fermentation, and Grinding. The* Medicins *of beſt note, and tryed, extracted out of* 117 *Authors, and reduced to an Alphabet of* 410 *Diſeaſes. Here is a learned Account of the late Plague in* London; *of the Epidemical and Vernaculous Diſeaſes of England and Wales; the peculiarity of our Air, Soil and Water: Alſo a Work of Chirurgery and Anatome, with a Breviate of the Plague in* Holland.

Here Potentiques *are diſcriminated, ranged, and explicated by the moſt Eſſential indications of Nature. The Culture of* Vegetables *appropiated for Orchards by* one; *and by* another *enlarg'd from the Flowry Garden to the Common fields and paſtures.* New England *and*

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the other Engliſh Plantations in America *acquaint us with their Vegetables and other rarities, chiefly for Medicine and Chirurgery.* Kermes *found to be in England, and* Cochineil *a kind of Kermes. The dancing Poyſon of the* Tarantula-*Spider and the Muſical cure disbelievd in* Otranto *and* Calabria, *their proper places. The manner how the bitings of* Vipers *do poiſon, with great diligence examin'd in Italy; their reſult more than once contradicted in France. The Lake* Lemain, *and the* Rhine *runing through it; ſome Fiſh Cantonizing there, ſome Wanderers, and many remarkables, accurately deſcribed. The* Winds, *in all their guiſes, by Sea and Land traced to their Originals. Prognoſticks, Remedies or Preventions of Dearth and mortalities propos'd. Regiſters of Weather paſt, of price of Corn, human Births and Burials, ſollicited.*

Here are ſome elaborate reſearches made into the Prerogative of Mans Mind; *the pretences to knowledge in* Beaſts; *the Souls of Brutes; the manner of* Senſation, *and* Animation; *into all the curious Motions in nature, perceptive, appetitive, vital. The poyſes of* Gravitation *are here weigh'd in Philoſophical Scales, both relatively and poſitively. The operations, which the varying Weight of the Atmoſphere may have even upon Mens Sickneſs or health, are inquired into.*

And for Voyages, a Pariſian *hath begun to give us the* fourth *Part of his Collections, relating to the Spaniſh Provinces in* America: *And two* Engliſh *Travellors have enricht us with their Obſervations of the Low-Countries, France, Germany, Helvetia, Griſons, Italy, Sicily, Malta and Spain. General Geography compleated beyond what others were aware of.*

My Lord, *I am ſenſible, I have gone beyond the bounds of an Addreſs, preſuming on your Lordſhips patience, whilſt I endeavor (as in your preſence) to ſatisfie ſuch as are pleas'd to accept of the beſt ſatisfaction I am able to offer, and which is, I think, ſufficient to prove, that knowledge grows on daily, more and more, and that our motion perſeveres to be progreſſive. And your Lordſhip well knows, (and our Regiſters partly publiſh'd, partly reſerv'd, do teſtifie it,) that the Deſigns of his Majeſties Royal Inſtitution receive good aſſiſtance and applauſe from the moſt Eminent in the chief parts of the World, and is either encourag'd or emulated by moſt of the Kings and Princes in Europe. May this* Royal Society, *and the Noble Sciences ever flouriſh; and may your Lordſhip, and all, that favor theſe obliging Deſigns, ever proſper. So wiſheth,* My Lord,

Your Lordſhips
Very humble and obedient Servant,
Henry Oldenburg, Soc. Reg. Secr.